

REMARKS

Reconsideration of the application is requested.

Claims 1-2 remain in the application. Claims 1-2 are subject to examination.

Under the heading "Claim Rejections - 35 USC § 103" on pages 2 and 3 of the above-identified Office Action, claims 1 and 2 have been rejected as being obvious over U.S. Patent No. 5,418,823 to Kervinen et al. (hereinafter Kervinen) in view of U.S. Patent No. 4,865,040 to Ogasawara (hereinafter Ogasawara) under 35 U.S.C. § 103.

The Examiner states that Kervinen discloses the "generation of a plurality of transmission impulses at a predetermined location of the multilayer component using an ultrasound head." With reference thereto, the Examiner refers to Landry (U.S. 5,063,780) and states that Landry teaches "ultrasound test heads X1 and X2" which serve the purpose of "measuring a tube."

According to col. 1, lines 9-12, Kervinen discloses a "method and an apparatus for non-destructively measuring the thickness of a bonded metallic lining on the interior surface of a thin-walled tubular object." In col. 2, lines 26-32, Kervinen discloses that an ultrasound wave method alone is not

sufficient to accurately detect the ultrasound echo of the boundary between the base material and the coating due to the similarity of the materials, the extreme thinness of the coating and the weakness of the echo.

Kervinen thus solves the object according to col. 2, lines 60-66 with a combined method of common ultrasound and eddy current technologies in a combined system that includes a specific method for calculating the layer thickness.

With the help of the ultrasonic measurement, according to col. 3, lines 10-15, only the inside diameter of the entire tube (including the coating, thus the boundary surface between coating and air, the main echo in the ultrasound pulse) is measured. The layer thickness of the coating is then determined later from the determined difference to the inside diameter which is determined by eddy current technology.

According to col. 8, lines 29-38, the ultrasound subsystem 503 is formed of conventional ultrasound equipment and a signal processing circuit 507. More detailed statements with reference to ultrasound measurement and system cannot be found in Kervinen. For this purpose, Kervinen refers to Landry.

According to col. 1, lines 50-60, Landry is based on the object of accelerating the inspection and measurement of

cladding tubes in a cost-efficient and simple manner. Landry does not discuss the measurement of the cladding tube coating. According to col. 2, starting at line 20, Landry solves the object by a plurality of ultrasound scanning heads that are pulsed in rapid sequence, whereby the ultrasound echoes are guided to a single evaluation electronic via a time multiplexer. In order to particularly achieve a fast and complete inspection of the component, according to col. 2, lines 16-30 of Landry, a plurality of spaced-apart inspection locations are shot by the ultrasound sensors which are disposed on spiral-shaped paths along the length of the component. In Landry, a certain location of a component is thus shot by only a single ultrasound impulse.

According to page 1, lines 13-19, the invention of the instant application - similarly to Kervinen - is based on the object of measuring the thickness of a weakly reflecting coating in a multi-layer component. In order to solve this object - contrary to the teaching of Kervinen - the layer thickness of inside coating of a tube is determined solely by the ultrasound method. The invention is thereby based on the knowledge that regardless of the weak echo signal a noise filtering of different noise phenomenon in the ultrasound echo is possible at the material boundary in order to improve the signal noise distance to the very weak ultrasound echo of the coating boundary. According to the second paragraph of claim

1 of the instant application, and contrary to Landry, a single predetermined location of the component is shot with a plurality of ultrasound impulses.

The Examiner further asserts that according to col. 8, lines 38-44, Kervinen discloses the digital recording of the echo signals of the ultrasound impulses, i.e., digitized diameter measurement data from ultrasonic measurement subsystem 502 is recorded in memory 504.

Actually, no ultrasound signal is digitally recorded in Kervinen. This is so because the ultrasound signal obtained by the ultrasound test device 505 is already evaluated in the signal processing circuitry 507 so that a number value is generated at its output. "Digitized diameter measurement data" according to col. 9, lines 16-19 of Kervinen thus actually represents the number value of the inside diameter ("resulting diameter data", ID_{ut}). This number value and not the ultrasound signal as an HF-image is recorded in the memory 504. This is also why the signal processing circuitry 507 in Fig. 5 is characterized as "A/D conv. and signal processing." Kervinen does not discuss the actual signal processing in the processing circuit 507.

Exactly such a signal processing is the object of the instant application as noted in the third paragraph of claim 1.

Contrary to Kervinen, no number value but the echo signal as an HF-image that belongs to an ultrasound impulse, is recorded.

The Examiner correctly states that in Ogasawara (U.S. 4,865,040), ultrasound image data and data of the ultrasound recording conditions are digitally overlapped. According to col. 1, lines 62-68, Ogasawara is thereby based on the object of superimposing ultrasound image data and data of the ultrasound recording conditions (which generally differ therefrom) in order to record them on the same recording sheet.

According to page 8, lines 4-6 of the instant invention - and contrary to Ogasawara - a single ultrasound echo (HF-image) is resolved into its echo periods and it is homogenously superimposed (according to an auto-correlation which generally differs from a pure superimposition).

However, neither Kervinen, Landry nor Ogasawara pertains to the topic of noise filtration of different sizes of noise in echo signals. None of the cited references alone, nor in combination leads a person of skill in the art to the instant invention, e.g. a method in which a plurality of ultrasound impulses are generated at a single predetermined location of a multi-layer component, the resulting echo signals which belong

to an ultrasound impulse are digitally recorded as HF-image and a plurality of wall thickness echo periods of different running times are homogenously superimposed.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claim 1. Claim 1 is, therefore, believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claim 1.

In view of the foregoing, reconsideration and allowance of claims 1-2 are solicited.

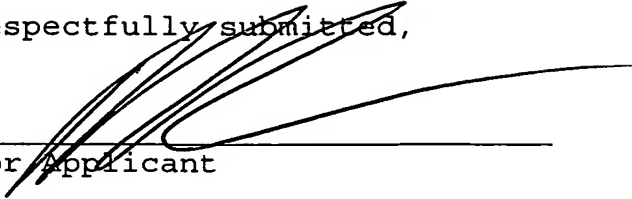
Petition for extension is herewith made. The extension fee for response within a period of two months pursuant to Section 1.136(a) in the amount of \$420.00 in accordance with Section 1.17 is enclosed herewith.

If an extension of time is required, petition for extension is herewith made. Any extension fee associated therewith should be charged to the Deposit Account of Lerner and Greenberg, P.A., No. 12-1099.

Please charge any other fees that might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner and

Greenberg, P.A., No. 12-1099.

Respectfully submitted,



For Applicant

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REL:cgm

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